Abstract

In the economy including two-sided matching and indivisible goods trades, some novel algorithms work desirably. In the two-sided matching economy, the deferred acceptance algorithm keeps much attention and is widely used in the real world to induce a stable matching. However, this algorithm does not work if agents have some irrational choice behavior like cyclic choices, which are often observed in many laboratory experiments and in the daily situations. In this paper, we incorporate such irrational choice behavior to agents in the sense that they do not necessarily have rational preferences (i.e. complete and transitive), so that their choice behavior do not need to be rationalized. We define a stability concept in this situation and show that, even if such behavior we allow agents to display, a stable matching always exists and it is attained by our *Generalized Deferred-Acceptance* algorithm. Moreover, if agents are rational, the outcome coincides with the one induced by the deferred acceptance algorithm for which input is preference profile which rationalizes each agent's choice behavior. Also, we consider the same motivated problem in the indivisible goods trading economy. We construct the *Generalized Top Trading Cycle* algorithm and show that this algorithm induces a core allocation in this economy. Moreover, this allocation coincides with a suitable notion of competitive equilibrium and thus (first) fundamental theorem of welfare economics can be extended.